

**WEST****Searches for User *tzalukaeva* (Count = 5161)**

Queries 5112 through 5161.










S #	Updt	Database	Query	Time	Comm
<u>S5161</u>	<u>U</u>	USPT	(3941724.pn. ) and (crosslink\$ or cross-link\$)	2002-05-14 19:17:00	
<u>S5160</u>	<u>U</u>	USPT	3941724.pn.	2002-05-14 19:16:35	
<u>S5159</u>	<u>U</u>	USPT,JPAB,EPAB,DWPI	3941724.pn.	2002-05-14 19:14:38	
<u>S5158</u>	<u>U</u>	USPT,JPAB,EPAB,DWPI	(((521/25  521/26  521/27  521/28  521/29  521/30  521/31  521/32  521/33  521/34  521/35 )!CCLS. ) )and (\$acrylic acid or methacryloylglycine or methacryloyl glycine) )and (crosslink\$ or cross link\$) ) and ((solvent or solution) polymerization)	2002-05-14 18:26:42	
<u>S5157</u>	<u>U</u>	USPT,JPAB,EPAB,DWPI	(((521/25  521/26  521/27  521/28  521/29  521/30  521/31  521/32  521/33  521/34  521/35 )!CCLS. ) )and (\$acrylic acid or methacryloylglycine or methacryloyl glycine) ) and (solvent polymerization)	2002-05-14 18:25:58	
<u>S5156</u>	<u>U</u>	USPT,JPAB,EPAB,DWPI	(((521/25  521/26  521/27  521/28  521/29  521/30  521/31  521/32  521/33  521/34  521/35 )!CCLS. ) )and (\$acrylic acid or methacryloylglycine or methacryloyl glycine) )and	2002-05-14 18:22:47	

			(crosslink\$ or cross link\$) ) and (acetic acid with water)	
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<u>S5154</u>	<u>U</u>	USPT,JPAB,EPAB,DWPI	(((521/25  521/26  521/27  521/28  521/29  521/30  521/31  521/32  521/33  521/34  521/35 )! .CCLS. ) )and (\$acrylic acid or methacryloylglycine or methacryloyl glycine) ) and (crosslink\$ or cross link\$)	2002-05-14 18:18:28
<u>S5153</u>	<u>U</u>	USPT,JPAB,EPAB,DWPI	(3988305.pn. ) and (\$acrylic acid or methacryloylglycine or methacryloyl glycine)	2002-05-14 18:16:59
<u>S5152</u>	<u>U</u>	USPT,JPAB,EPAB,DWPI	((521/25  521/26  521/27  521/28  521/29  521/30  521/31  521/32  521/33  521/34  521/35 )! .CCLS. )	2002-05-14 18:15:58
<u>S5151</u>	<u>U</u>	USPT,PGPB,JPAB,EPAB,DWPI,TDBD	3988305.pn.	2002-05-14 17:54:28
<u>S5150</u>	<u>U</u>	USPT,PGPB,JPAB,EPAB,DWPI,TDBD	3037052.pn.	2002-05-14 17:52:22
<u>S5149</u>	<u>U</u>	USPT,PGPB,JPAB,EPAB,DWPI,TDBD	2963453.pn.	2002-05-14 17:51:16
<u>S5148</u>	<u>U</u>	USPT,PGPB,JPAB,EPAB,DWPI,TDBD	2885371.pn.	2002-05-14 17:50:04
<u>S5147</u>	<u>U</u>	USPT,PGPB,JPAB,EPAB,DWPI,TDBD	\$polymer\$ same \$acrylic acid same crosslinking agent same organic solvent same water	2002-05-14 17:06:58
<u>S5146</u>	<u>U</u>	USPT,PGPB,JPAB,EPAB,DWPI,TDBD	\$polymer\$ same \$acrylic acid same (triacryloyltriazine or methylenediacrylamide or triallyl isocuanurate or ethylenedimethacrylamide)	2002-05-14 16:31:13

**WEST**

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L17: Entry 1 of 5

File: USPT

Mar 2, 1976

US-PAT-NO: 3941724

DOCUMENT-IDENTIFIER: US 3941724 A

TITLE: Production of amphoteric resins in a reaction medium comprising formic acid

DATE-ISSUED: March 2, 1976

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bolto; Brian Alfred	Mitcham			AU

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE	CODE
ICI Australia Limited	Melbourne			AU		03
Commonwealth Scientific and Industrial Research Organization	Campbell			AU		07

APPL-NO: 5/ 492966 [PALM]

DATE FILED: July 26, 1974

## FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
AU	4415/73	August 9, 1973

INT-CL: [2] C08F 20/04, C08J 5/20, C08F 22/02, C08F 2/54

US-CL-ISSUED: 260/2.1R; 260/78UA, 260/78.5R, 260/2.1M, 260/80.3N, 260/88.3R, 204/159.22

US-CL-CURRENT: 521/38; 521/28, 522/173, 526/216, 526/295, 526/310, 526/312

FIELD-OF-SEARCH: 260/8.3N, 260/2.1R, 260/2.1M, 260/78.5R, 260/78UA, 450/703

PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

Search Selected

Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<u>2949442</u>	August 1960	Clavier et al.	260/80.3N
<input type="checkbox"/>	<u>3032538</u>	May 1962	Spaulding et al.	260/80.3N
<input type="checkbox"/>	<u>3808158</u>	April 1974	Bolto	260/80.3N
<input type="checkbox"/>	<u>3839237</u>	October 1974	Battaerd et al.	260/80.3N
<input type="checkbox"/>	<u>3891576</u>	June 1975	Battaerd et al.	260/2.1R

ART-UNIT: 144

**WEST****End of Result Set**

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L4: Entry 4 of 4

File: DWPI

Apr 5, 1976

DERWENT-ACC-NO: 1976-78901X

DERWENT-WEEK: 197642

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TITLE: Poly-acrylate soil and ground coat aggregator prepn. - from methylene-bis-acrylamide or hexahydro-triacryloyl-triazine comonomers to increase soil strength

PATENT-ASSIGNEE: MOSCOW MENDELEEV CHEM IN (MEEN)

PRIORITY-DATA: 1974SU-2030239 (June 5, 1974)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
SU 499276 A	April 5, 1976		000	

INT-CL (IPC): C08F 22/00

ABSTRACTED-PUB-NO: SU 499276A

## BASIC-ABSTRACT:

Polyacrylate soil and ground coat aggregators, giving increased soil strength, are prepd. using methylene-bis-acrylamide (II) and hexahydro-1,3,5-triacryloyl triazine (III) as comonomers, in ratios of acrylic acid (I):(II)= 23:2-24:1 and (I):(III)=23.2-49:1; copolymerisation is in aq. soln. in presence of free radical initiators, e.g. 3:1 K-persulphate:Na-hydrosulphite at 10-20 degrees C, to give respective copolymeric structures: which are insoluble in organic solvents and resistant to conc. acids and alkalis, hydrolysis and temp.

ABSTRACTED-PUB-NO: SU 499276A

## EQUIVALENT-ABSTRACTS:

DERWENT-CLASS: A93 L02

CPI-CODES: A04-A03; A04-B; A04-F04; A12-A02; L02-D12;

**WEST****End of Result Set**

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L3: Entry 2 of 2

File: DWPI

Apr 5, 1976

DERWENT-ACC-NO: 1976-78901X

DERWENT-WEEK: 197642

COPYRIGHT 2002 DERWENT INFORMATION LTD

TITLE: Poly-acrylate soil and ground coat aggregator prepn. - from methylene-bis-acrylamide or hexahydro-triacryloyl-triazine comonomers to increase soil strength

PATENT-ASSIGNEE: MOSCOW MENDELEEV CHEM IN (MEEN)

PRIORITY-DATA: 1974SU-2030239 (June 5, 1974)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
SU 499276 A	April 5, 1976		000	

INT-CL (IPC): C08F 22/00

ABSTRACTED-PUB-NO: SU 499276A

BASIC-ABSTRACT:

Polyacrylate soil and ground coat aggregators, giving increased soil strength, are prepd. using methylene-bis-acrylamide (II) and hexahydro-1,3,5-triacryloyl triazine (III) as comonomers, in ratios of acrylic acid (I):(II)= 23:2-24:1 and (I):(III)=23.2-49:1; copolymerisation is in aq. soln. in presence of free radical initiators, e.g. 3:1 K-persulphate:Na-hydrosulphite at 10-20 degrees C, to give respective copolymeric structures: which are insoluble in organic solvents and resistant to conc. acids and alkalis, hydrolysis and temp.

ABSTRACTED-PUB-NO: SU 499276A

EQUIVALENT-ABSTRACTS:

DERWENT-CLASS: A93 L02

CPI-CODES: A04-A03; A04-B; A04-F04; A12-A02; L02-D12;

**WEST**

Generate Collection

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L4: Entry 1 of 4

File: USPT

May 29, 1984

DOCUMENT-IDENTIFIER: US 4451581 A  
TITLE: Ion exchange resin

Brief Summary Paragraph Right (23):

The characterizing polyetheramine component of the resins of the present invention is compatible with, and may be used with, the acidic ion exchange components generally used in thermally regenerable amphoteric resins. The monomeric materials from which these acidic ion exchange components are made are varied and well known. Preferred monomers include ethylenically unsaturated carboxylic acids, such as acrylic acid, methacrylic acid, maleic acid, itaconic acid, crotonic acid, or vinyl benzoic acid. Alternatively, derivatives of such monomers such as an ester, anhydride or nitrile which can be converted into the desired weak acid functionality by hydrolysis can be used. Typical examples of such derivatives include methyl acrylate, maleic anhydride or acrylonitrile. It is often desirable to crosslink such acidic polymeric components and under these circumstances it is convenient to have from 0.5 to 10% of a polyvinyl crosslinking agent present with the acidic monomer during the polymerization step. Suitable polyvinyl crosslinking agents include divinylbenzene divinylpyridine, divinyltoluene, divinylphthalene, diallyl phthalate, ethylene glycol diacrylate, ethyleneglycol dimethylacrylate, diallyl succinate or N,N'-methylenediacrylamide. Particularly suitable acidic polymeric components are those prepared by polymerization of acrylic or methacrylic acid optionally crosslinked by the use of divinylbenzene.

**WEST**

Generate Collection

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L4: Entry 2 of 4

File: USPT

Mar 29, 1983

DOCUMENT-IDENTIFIER: US 4378439 A  
TITLE: Purification of saline solutions

Brief Summary Paragraph Right (11):

Acidic polymeric components for thermally regenerable ion-exchange materials may be formed by the polymerisation of an ethylenically unsaturated carboxylic acid. Examples of useful ethylenically unsaturated carboxylic acid monomers include acrylic acid, methacrylic acid, maleic acid, itaconic acid, crotonic acid, or vinyl benzoic acid. Alternatively, derivatives of such monomers such as an ester, anhydride or nitrile which can be converted into the desired weak acid functionality by hydrolysis can be used. Typical examples of such derivatives include methylacrylate, maleic anhydride or acrylonitrile. It is often desirable to crosslink such acidic polymeric components and under these circumstances it is convenient to have from 0.5 to 10% w/w of a polyvinyl crosslinker present with the acidic monomer during the polymerization step. Suitable polyvinyl crosslinking agents include divinylbenzene, divinylpyridine, divinyltoluene, divinylanthracene, diallylphthalate, ethylene glycol diacrylate, ethylene glycol dimethylacrylate, diallyl succinate or N,N'-methylenediacylamide. Particularly suitable acidic polymeric components are those prepared by polymerization of acrylic or methacrylic acid optionally crosslinked by the use of divinylbenzene.

**WEST****End of Result Set**

Generate Collection

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L4: Entry 4 of 4

File: DWPI

Apr 5, 1976

DERWENT-ACC-NO: 1976-78901X

DERWENT-WEEK: 197642

COPYRIGHT 2002 DERWENT INFORMATION LTD

TITLE: Poly-acrylate soil and ground coat aggregator prepn. - from methylene-bis-acrylamide or hexahydro-triacryloyl-triazine comonomers to increase soil strength

**Basic Abstract Text:**

Polyacrylate soil and ground coat aggregators, giving increased soil strength, are prepd. using methylene-bis-acrylamide (II) and hexahydro-1,3,5-triacryloyl triazine (III) as comonomers, in ratios of acrylic acid (I):(II)= 23:2-24:1 and (I):(III)=23.2-49:1; copolymerisation is in aq. soln. in presence of free radical initiators, e.g. 3:1 K-persulphate:Na-hydrosulphite at 10-20 degrees C, to give respective copolymeric structures: which are insoluble in organic solvents and resistant to conc. acids and alkalis, hydrolysis and temp.

**Basic Abstract Text (1):**

Polyacrylate soil and ground coat aggregators, giving increased soil strength, are prepd. using methylene-bis-acrylamide (II) and hexahydro-1,3,5-triacryloyl triazine (III) as comonomers, in ratios of acrylic acid (I):(II)= 23:2-24:1 and (I):(III)=23.2-49:1; copolymerisation is in aq. soln. in presence of free radical initiators, e.g. 3:1 K-persulphate:Na-hydrosulphite at 10-20 degrees C, to give respective copolymeric structures: which are insoluble in organic solvents and resistant to conc. acids and alkalis, hydrolysis and temp.



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L9: Entry 1 of 3

File: USPT

Oct 26, 1976

US-PAT-NO: 3988305

DOCUMENT-IDENTIFIER: US 3988305 A

TITLE: Method of producing soluble glycol methacrylate or glycol acrylate polymers and copolymers containing a minor amount of diester crosslinking comonomers

DATE-ISSUED: October 26, 1976

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Stol; Miroslav	Prague			CS
Stoy; Vladimir	Prague			CS
Tuzar; Zdenek	Prague			CS

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Ceskoslovenska akademie ved	Prague			CS	03

APPL-NO: 5/ 538154 [PALM]

DATE FILED: January 2, 1975

## PARENT-CASE:

This is continuation application of Ser. No. 297,389, filed Oct. 13, 1972, now abandoned.

## FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
CS	7233-71	October 14, 1971

INT-CL: [2] C08F 218/00, C08F 220/00, C08F 222/00, C08F 224/00

US-CL-ISSUED: 526/79; 526/194, 526/206, 526/208, 526/210, 526/213, 526/263, 526/271, 526/272, 526/303, 526/310, 526/317, 526/318, 526/328, 526/329, 526/342, 526/347  
US-CL-CURRENT: 526/79; 526/194, 526/206, 526/208, 526/210, 526/213, 526/263, 526/271, 526/272, 526/307.5, 526/310, 526/318, 526/318.2, 526/318.42, 526/328.5, 526/329, 526/329.2, 526/329.3, 526/329.5, 526/344, 526/347

FIELD-OF-SEARCH: 260/86.1E, 260/86.1N, 260/80.81, 260/80.80, 260/80.73, 260/80.72, 260/80.76, 260/80.75, 260/78.5R, 260/78.5BB, 260/80.78

ART-UNIT: 144

PRIMARY-EXAMINER: Schofer; Joseph L.

ASSISTANT-EXAMINER: Lilling; Herbert J.

## ABSTRACT:

A starting monomer mixture containing a minor amount of a cross linking agent is precipitation polymerized in a diluent/precipitant which is an unlimited solvent for the starting monomers but is neither a solvent or a substantial swelling agent for the resultant polymer. The amount of cross linking agent is maintained during polymerization at a critically low percent by volume relative to the entire polymerization mixture. The resultant product falling from the polymerization contains

substantially only soluble hydrophilic polymers and copolymers.

18 Claims, 3 Drawing figures

**WEST**

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L16: Entry 3 of 15

File: USPT

Jul 18, 2000

DOCUMENT-IDENTIFIER: US 6090258 A

TITLE: Ion-exchange spacer and processes for the preparation thereof

Brief Summary Paragraph Right (9):

Thus, according to the present invention a netting, widely used as spacer in ED, consisting of polypropylene, polyethylene or polyolefin copolymer or mixture thereof is coated with a solution containing soluble or crosslinked polymers and both heterogeneous and homogeneous coatings are obtained. The simplest heterogeneous coating contains ground anion-exchange particles suspended in an aqueous solution of polyvinyl alcohol (PVA), with hexamethoxymelamine as cross-linker. With regard to this embodiment it was surprising to find that one can coat the aqueous solution onto the hydrophobic polypropylene. It was also found that wetting is improved by pretreatment of the spacer in concentrated sulfuric acid. A homogeneous coating consisted of bromomethylated polysulfone, from organic solution. Amination of the bromomethylgroups in the dried spacer transformed it into an anion-exchanger.

Brief Summary Paragraph Right (16):

percolation of the ions which are counter-ions of the resin is possible, and perm-selective membranes are obtained. The electric resistance of these membranes is generally higher than that of the homogeneous membranes comprising of crosslinked, charged polymers. For the effective function of the conducting spacer, the local conductance in the coating has to be significantly higher than that of the surrounding solution. Ion-exchange resins will maintain a higher concentration of mobile ions and thus a higher conductance.

Brief Summary Paragraph Right (17):

Permselectivity per se is not required. To achieve these properties, according to the present invention, ground ion-exchange resin is embedded in a hydrophilic polymer, e.g., in polyvinyl alcohol (PVA), which allows passage of ions. Ground anion-exchange or cation-exchange resin for anion-conducting or cation-conducting spacer respectively is used. The resin is dispersed in an aqueous solution of PVA, the spacer is coated and dried and the PVA is crosslinked by a suitable agent during the drying or subsequent curing. In order to keep the openings of the net undisturbed, air is preferably blown across the spacer before drying. One cycle of dipping and drying will generally not deposit a large enough amount of coating, and therefore the process is repeated. On industrial scale, repeated coating and drying can be carried out in one continuous process.

Brief Summary Paragraph Right (18):

Various reagents are available for the cross-linking of PVA. Di-carboxylic acids have been used in the preparation of membranes, reactive dyes were used for binding to hydroxyls, cellulosic membranes and PVA were crosslinked with reactive dyes, also di-aldehydes can be used. For the cross-linking of the anion-exchange spacer. Hexamethoxymethylmelamine (HMMM) was chosen, which gives with acid catalysts, a stable, crosslinked structure.

Brief Summary Paragraph Right (19):

Heterogeneous films were prepared by spreading the aqueous suspension containing the cross-linking agent on a glass plate and drying. The coating was chosen from compositions which gave stable films. The heterogeneous cation-exchange spacer can be crosslinked either by HMMM, by active dyes or mixtures thereof.

Brief Summary Paragraph Right (23):

After various modes of testing, it was decided to choose as decisive grading for the efficacy of spacers, the rate of desalting from 3 meq./lit to 0.3 meq./lit., at

constant, practically applicable, voltage. Any enhancement of desalting rate, at constant voltage, can be due to decrease of ohmic resistance and/or to increased current efficiency. Looking at all the variations prepared, it turns out that the overall ion exchange capacity is decisive. A substantial decrease in desalination time was achieved with the simple and quite inexpensive coating described above, ground anion-exchanger in crosslinked PVA.

Brief Summary Paragraph Right (31):

The polymer coating may, of course, be subsequently crosslinked through its thickness, or otherwise modified to introduce ionic groups, as described herein.

Brief Summary Paragraph Right (37):

Preferred grafting monomers are hydrophilic and preferably selected from the group consisting of hydroxyalkyl acrylates, hydroxyalkyl methacrylates, 2-hydroxy ethyl methacrylate and hydroxypropyl methacrylate and result in hydrophilic coatings, or they may be relatively hydrophobic with limited water solubility (e.g., vinyl acetate), and converted into hydrophilic groups, by for example, hydrolysis. Other monomers which introduce crosslinks (e.g., ethylene glycol dimethacrylate, diethylene glycol dimethacrylate, tetrachylene glycol dimethacrylate) and/or ionic groups (for example vinylsulfonic, acrylic acid, aminoethyl methacrylate, amino styrene and the methyl or ethyl quaternary derivatives of the amine monomers), may be used to form co- or tri-polymers.

Brief Summary Paragraph Right (38):

The coating may be further reacted, as described in the present specification to introduce crosslinks and ionic charges. Water is the preferred solvent for these polymerizations, but water miscible solvents such as low molecular weight alcohols [e.g., ethyl, methyl and propyl alcohols] and ketones [e.g., acetone], may be added to increase monomer solubility.

Brief Summary Paragraph Right (39):

The chemically grafted coating may contain particles, preferably added to the monomer solutions prior to application, and grafting to the spacer. The viscosity of this solution may be increased to keep the particles in place, by a polymer added to the monomer solution, which may also crosslink the polymerizing grafted polymer {e.g., via radical reactions}. For example, the monomer may be hydroxy ethyl methacrylate and the polymer polyvinyl alcohol or a polyvinyl alcohol copolymer, and the initiator a persulfate/metabisulfite couple. Polymers may also be added to the monomer solution to introduce ionic groups or mechanical strength without particles in the coating solution formulation. These polymers can react with the forming polymer via the free radicals generated during the polymerization process. Alternatively, they may not react, but form an interpenetrating network with the crosslinked network formed by the graft polymerization process.

Detailed Description Paragraph Right (4):

The interstices of the network were opened by an air stream and only the filaments of the spacer remained covered with layer of reaction mixture. The coating was crosslinked at 80.degree. C. during 40 min. This procedure was carried out a few times.

Current US Cross Reference Classification (5):

521/28

Current US Cross Reference Classification (6):

521/29

CLAIMS:

5. A polymeric netting according to claim 4 wherein said polymer is cross-linked polyvinyl alcohol.

11. A process according to claim 10 wherein said polymer is cross-linked polyvinyl alcohol.

17. The stack of claim 16 wherein the coating is cross-linked polyvinyl alcohol wherein the cross-linking is achieved with a cross-linking agent selected from the group consisting of hexamethoxymethylmelamine, active dyes and mixtures thereof.

**WEST**

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L16: Entry 14 of 15

File: USPT

Mar 2, 1976

DOCUMENT-IDENTIFIER: US 3941724 A

TITLE: Production of amphoteric resins in a reaction medium comprising formic acid

Brief Summary Paragraph Right (10):

Formic acid appears unique in its ability to prevent self neutralisation reactions occurring during the preparation of amphoteric resins. We have found that other carboxylic acids such as acetic acid or propionic acid are not satisfactory solvents for the polymerisation of a mixture of acidic and basic monomers as the resultant product has negligible thermally regenerable ion-exchange activity.

Brief Summary Paragraph Right (12):

The monomers chosen for the preparation of the resins in accordance with the present invention may be, typically, those known in the art to be suitable for the production of ion-exchange resins. The basic sites may, for example, be derived from any weakly basic groups, such as substituted amines, preferably ethylenically substituted amines such as allylamines and especially triallylamine; similarly, acidic sites may be those derived from unsaturated carboxylic acids containing groups such as acrylic acid and methacrylic acid. Other monomers which would be suitable for resins of this type include basic monomers such as N-alkylethyleneimines, dimethylaminoethyl methacrylate, t-butylaminoethyl methacrylate, N,N-dialkylaminomethylstyrene and acidic monomers such as maleic acid, vinylacetic acid, allylacetic acid, maleamic acid, N-alkylmaleamic acids, N-arylmaleamic acids and the like.

Brief Summary Paragraph Right (19):

In certain cases it is advantageous to combine chemical initiation with radiation initiation. For example, it is possible to increase the degree of crosslinking of a polymer formed by chemical initiation if the polymer is further treated with radiation.

Brief Summary Paragraph Right (42):

Preferably the third monomer is di-functional and acts as a crosslinking agent, leading to extension of the polymeric network.

Brief Summary Paragraph Right (43):

Suitable crosslinking agents are, for example, ethylene glycol dimethacrylate, 1,3-butylene glycol dimethacrylate, divinylbenzene, triallyl cyanurate, the triallyl ether of pentaerythritol and the like. We believe that the addition of a crosslinking agent has a twofold purpose: to aid in the permanent separation of the acidic and basic sites, and to minimise loss of linear polymer. Hence if the crosslinking agent polymerises at a rate comparable with that of the acid monomer, two interpenetrating networks may be formed, with the crosslinked polyacid enmeshed in the polytriallylamine network, the latter being self-crosslinking. In cases where a non-crosslinking allylamine monomer is employed, a further crosslinking agent compatible with the allylamine may be used; two interpenetrating networks will again be formed.

Brief Summary Paragraph Right (44):

We believe that the increase in effective capacity of such additionally crosslinked amphoteric polymeric compositions is due to the greater rigidity of the system; the ion-exchange groups cannot as readily relocate after the polymerisation because the network is held more firmly in its non-associated configuration.

Brief Summary Paragraph Right (45):

The amount of crosslinking agent present is not narrowly critical but we have found that resins for use in the "Sirotherm" process may be prepared by polymerising mixtures comprising an allylamine salt, an acidic monomer in a solvent system as defined herein

above and a crosslinking agent wherein the crosslinking agent is present in an amount from 0 - 50% w/w of the polymeric composition preferably from 10 - 30% w/w.

Detailed Description Paragraph Right (2):

This example illustrates the preparation of an amphoteric resin by the polymerization of methacrylic acid and triallylamine hydrochloride using gamma irradiation in the presence of formic acid.

Detailed Description Paragraph Right (3):

Methacrylic acid (6.0 ml, 70 meq) was mixed with 70% solution of triallylamine hydrochloride (8.5 ml, 35 meq), together with 98% formic acid (10.0 ml, 260 meq). The homogeneous solution was deoxygenated by a vacuum treatment cycle, in which the mixture was cooled to liquid nitrogen temperature, and the container connected to a vacuum system where pumping was maintained for 2 minutes. The container was then sealed and placed in an acetone/dry ice slurry, and after thermal equilibrium had been established, pumping was carried out for 0.5 minutes. The cycle was repeated a number of times to ensure complete oxygen removal.

Detailed Description Paragraph Right (6):

This example illustrates the preparation of amphoteric resins by the polymerization of methacrylic acid and triallylamine hydrochloride using gamma irradiation in the presence of various solvents.

Detailed Description Paragraph Right (9):

This example illustrates the preparation of a amphoteric resin by the polymerization of methacrylic acid and triallylamine hydrochloride using chemical initiation in the presence of formic acid.

Detailed Description Paragraph Right (10):

Methacrylic acid (6.0 ml, 70 meq), a 70% solution of triallylamine hydrochloride (8.5 ml, 35 meq), 98% formic acid (10.0 ml, 260 meq) and alpha, alpha'-azo-bis-isobutyronitrile (0.3 g or 2.5% w/w on the two monomers) were mixed and shaken to achieve a clear, homogeneous solution. After deoxygenation, it was heated under nitrogen at 70.degree.C for 17 hours. The solid product was worked up as described in Example 1.

Detailed Description Paragraph Right (11):

This example outlines the preparation of an amphoteric resin by the suspension polymerization of acrylic acid and triallylamine hydrochloride using chemical initiation in the presence of formic acid.

Detailed Description Paragraph Right (12):

Triallylamine hydrochloride solution (70% solution in water, 17.0 ml, 70 meq) was dehydrated on a boiling water bath using a water pump to evacuate the system, and to it was added acrylic acid (5.0 g, 70 meq) and commercial divinylbenzene, (54% divinylbenzene, 8.8 ml i.e. sufficient to give 20% crosslinking by weight, based on the total amount of polymerizable monomers present). To the cold solution was added alpha, alpha'-azo-bis-isobutyronitrile (0.46 g) as initiator and formic acid (10.0 ml).

Detailed Description Paragraph Right (14):

The stirring was continued with heating overnight (17 hr). The solid beads were filtered off and washed with hexane, followed by acetone, using three alternating washes with each solvent. The beads were then washed in a column using 2N alkali, 2N hydrochloric acid, and water to pH3, to give a crosslinked amphoteric resin with the acid groups in the hydrogen form and the amino groups in the hydrochloride form.

Current US Cross Reference Classification (1):

521/28

CLAIMS:

6. A process according to claim 1 wherein the unsaturated carboxylic acid is acrylic acid or methacrylic acid.